CSE360 LAB Project Proposal

Summer 2022

Title of the project : Early flood detection system

Group Number : 6

Group Members :

Student ID	Student Name
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• Introduction

"Early Flood Detection System" is an intelligent system which keeps close watch over various natural factors to predict floods. Thus we can embrace ourselves for caution. It can be used to minimize the damage caused by the flood. To eliminate or lessen the impacts of the flood, the system uses various natural factors to detect floods. Natural disasters like a flood can be devastating leading to property damage and loss of lives. This system is extremely practical in rainy areas and can alert us if there is any flooding. The project uses an Arduino together with some sensors to create the alerting alarm effect.

• Application Area

The system we will be building, falls under embedded systems. Basically embedded systems are task specific devices. One of its most important characteristics is giving the output within the time constraints or they are a time bound system. These embedded systems help to make the work more convenient and accurate. Embedded systems can be used to monitor water level altitude and velocity of water flow because it is low cost. One good device for embedded systems for prototyping is the Arduino Uno. Arduino uno is chosen to be used as a processing device because this system needs to have some features. The system will observe the height of water level and speed of the water flow.

• Technology and tools

In this project we will be building a prototype which can be used to detect water level in some pond, dam or reservoir and then send an alert using a buzzer. This is just a small scale prototype in which we are going to use an Arduino UNO, Ultrasonic sensor, Water Flow Sensor, Water Level Sensor, Buzzer, Resistor, Capacitors, Transistors, Diodes, Breadboards, Adapter, Push Buttons, Switch, LCD and some connecting wires.

• Programming language

We will use the C and C++ language to program the board which is very easy to learn and use.

• Working mechanism of Sensors

Ultrasonic Sensor: Ultrasonic sensors are a vital component of modern flood detection and alert systems. As they utilize high-frequency soundwaves to calculate the distance to a remote object without physically touching it, they can be used to create systems that reliably determine wave height and water levels at much lower installation and maintenance costs.

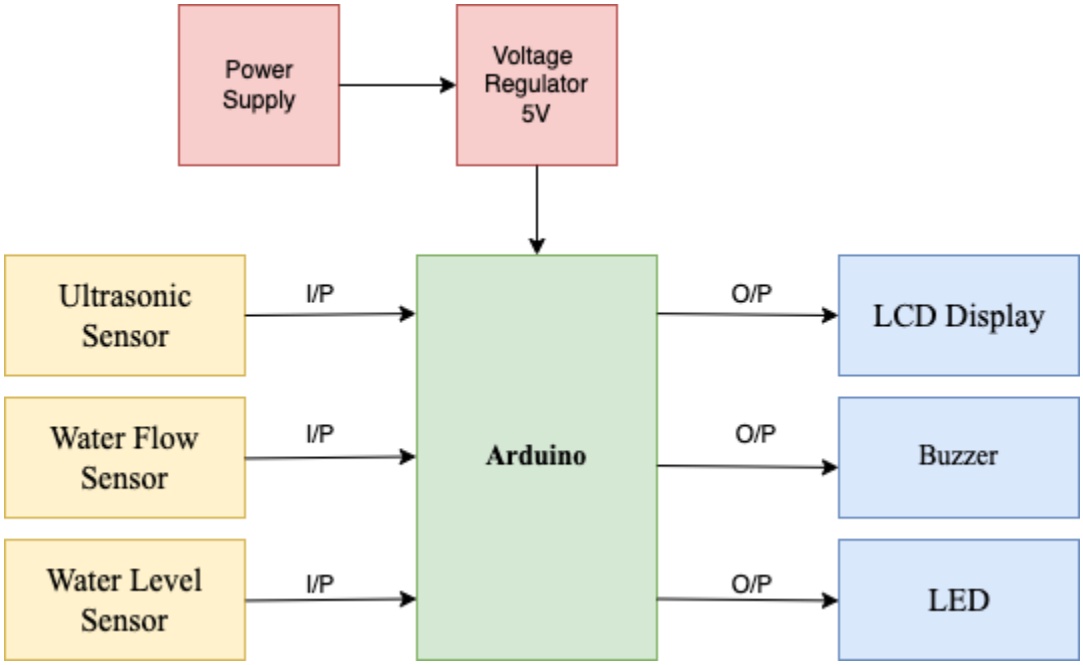
Water level Sensor: Water level sensor is considered one of the important devices which has been used in the project because from this device can be recognized the current level of water. The function of this sensor is detecting the rising of water. When the water is rising up it will send the signal to the PIC. In this situation it needs to give accurate information about the level of water.

Water flow Sensor: In this prototype water flow sensor will be used to provide information of water flow stability. The decrease or increase of the water flow through the sensor depends on the flow rate of the water source. The water flow through the sensor will rotate the impeller in the sensor. The rotation of the impeller will create a magnetic field on the coil in the water flow sensor. The magnetic field will be converted by Hall Effect into a pulse signal. The pulses are then converted to water flow rates.

• Connection with ICs

The system is implemented successfully with creating necessary dataset for flood detection. The Arduino is connected to the water level sensor and water flow sensor, which detects the water level and the Flood Monitoring and Alerting System is designed on the basis of an Arduino controller. The Arduino plays a major role. The Arduino is connected through various sensors to predict the water level frequently. The inbuilt GSM is being used along with the Arduino. The water level sensor will be connected to the controller in order to track the water level. The water limiting sensor is connected to the controller to maintain the level of water and water flow sensor is used if the water level rises over a level mentioned it will be recorded and will be sent as an alert. These sensors will collectively send their values to the controller and the controller will then send an alert message to the output devices. These devices need to be installed on different areas and the signals will be sent to that particular station.

• **Data flow from sensors through ICs to I/O devices :**

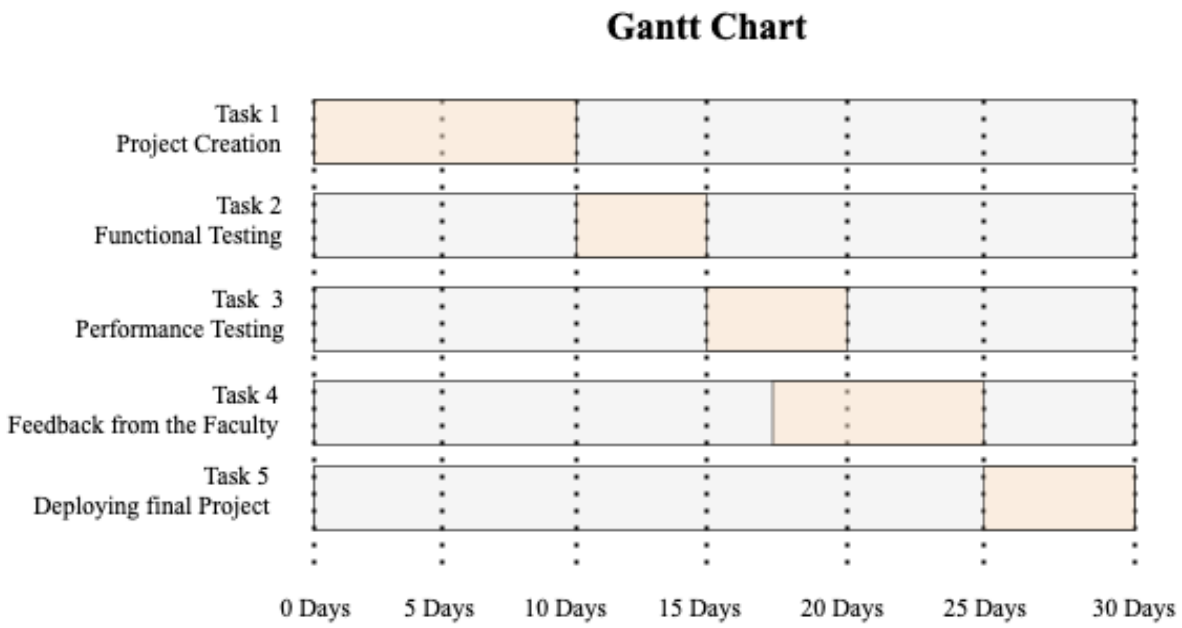


• **Estimated cost analysis :**

Components	Prices
Arduino Uno	1330
Ultrasonic Sensor	90
Water Flow Sensor	299
Water Level Sensor	480
LCD Display	395
Resistor	10

Capacitors	10
Transistors	10
Cables and Connectors	100
Diodes	10
Breadboards	100
LED	10
Adapter	350
Push Buttons	20
Switch	20
Buzzer	16
Total	**3250**

• **Workplan (Gantt Chart) :**



• **Conclusion :**

Early Flood Detection & Avoidance System is an intelligent system that monitors many natural elements to forecast a flood so that we can prepare for it and minimize the damage caused by it. The system is made up of many sensors that gather data for various characteristics such as ultrasonic sensor, water level, and flow level.System consists of different sensors which collect data for individual parameters. The water flow sensor consists of a plastic valve body, a water rotor, and a hall-effect sensor. Once the water level drops below a predetermined point, the circuit completes itself and sends electricity through the completed circuit to trigger an alarm. The sensors are all linked to the Arduino UNO, which analyzes and stores data.

• **References :**

1.https://www.youtube.com/watch?v=8L0We19NkDw

2.https://create.arduino.cc/projecthub/dipti2503/flood-detection-using-iot-a8d5db